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Agency

Enforcement and
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EPA

Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Muskego Sanitary Landfill Site Profile

Site Description:
Three disposal areas on former farm

Site Size: 56 acres

Primary Contaminants:
Volatile organic compounds and heavy metals

Potential Health Effects: Central nervous system disorders and increased incidence of cancer

Nearby Population: 19,000 in City of Muskego

Ecological Effects:
Area wetlands on the southeast boundary

Year Listed on NPL: 1984

Region: 5

State: Wisconsin

District: 9

Success in Brief

Cooperation Results in Accelerated Cleanup

The early 1970s were days of pioneering the basic design of the "sanitary" landfill. Municipal wastes were compacted and sandwiched between layers of dirt, forstalling problems associated with rodents and flies. Sewage solids, radioactive and pathologic wastes, explosive materials, and spent manufacturing chemicals went in with the rusting stoves and refrigerators.

The City of Muskego operated such a landfill on an old farm in Waukesha County, Wisconsin. Over a 30-year period, several disposal areas had leached hazardous contaminants into area ground water, tainting residential wells.

After successful negotiations with the U.S. Environmental Protection Agency (EPA), Waste Management of Wisconsin, Inc. conducted field studies, removed leaking drums and debris from open trenches, and agreed to conduct a two-part remediation worth $11 million.

Workers removed about 1,000 leaking 55-gallon drums of paint waste and cleaning solvents.

The Site Today

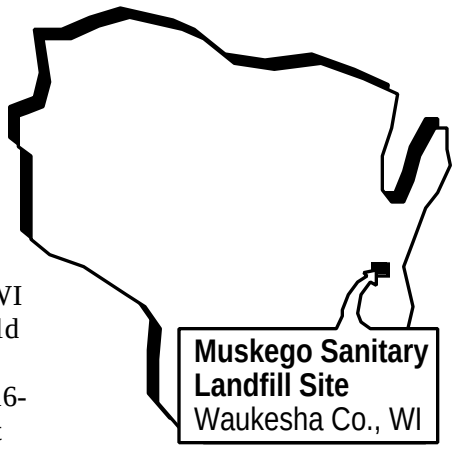
A multi-layer protective cap complete with leachate and methane collection systems permanently seals the landfill. Ground water pump-and-treat is ongoing until 1997. Monitoring and maintenance activities are continuing in conjunction with the State of Wisconsin.

A Site Snapshot

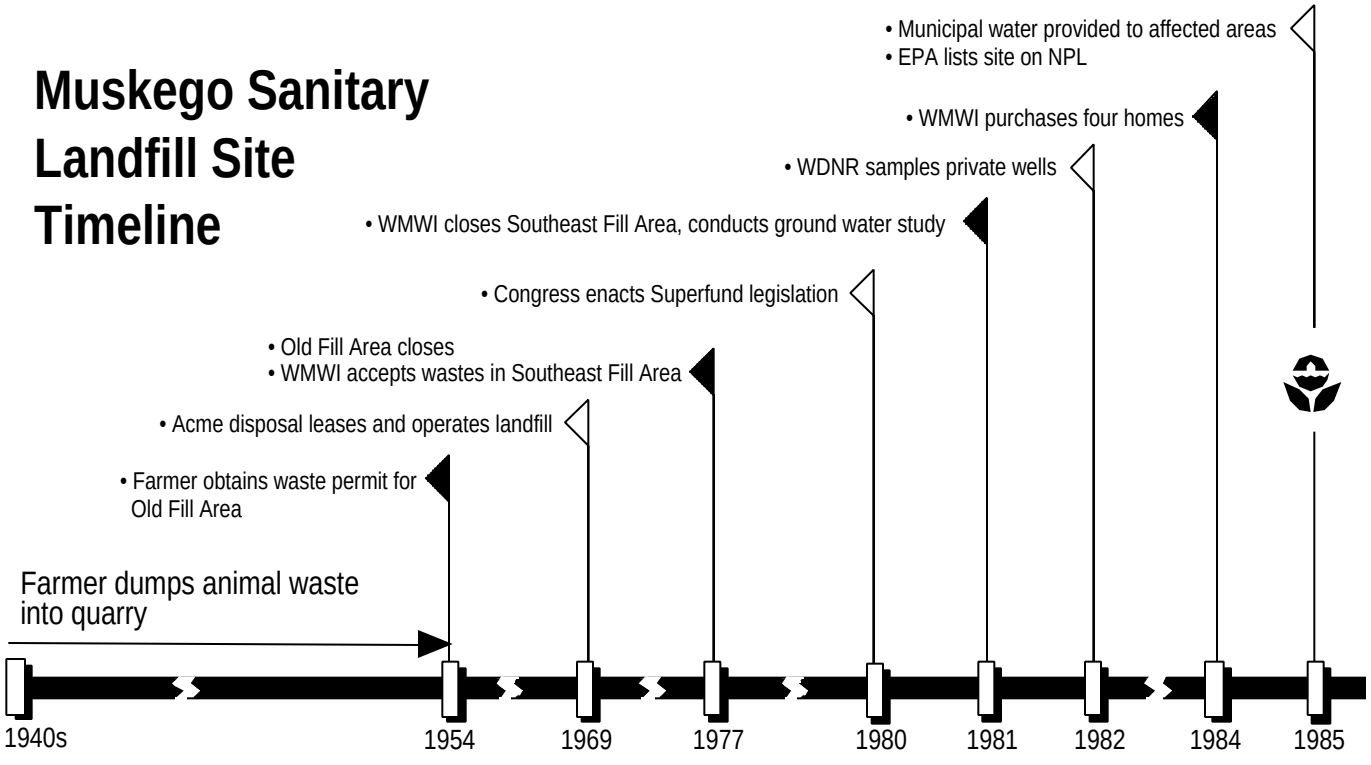
The 56-acre Muskego Sanitary Landfill site encompasses a former farm, a former sand and gravel pit, and two landfills. The Alfred Wauer family operated the Anamax Rendering Plant and used an inactive quarry to dispose of carcasses and other wastes from this operation. The quarry turned into an open dump, and in 1954 the Wauers obtained a permit from the City of Muskego to operate what became known as "The Old Fill Area".

During the 1960s, the Wauers allegedly accepted waste oils and paint products in the dump; occasionally liquid wastes were dumped into pits and material was burned in open fires. In 1969, Acme Disposal, which later became a subsidiary of Waste Management of Wisconsin, Inc. (WMWI), leased this part of the property from the Wauers. Acme later obtained a license from the Wisconsin Department of Natural Resources (WDNR) to operate a sanitary landfill for household, municipal, industrial, and commercial wastes.

In 1975, the WDNR detected ground water contamination and ordered WMWI to cap and close the 36-acre Old Fill Area. In 1977, WMWI started accepting wastes in a 16-acre area called the "Southeast Fill Area", which remained active until 1981. A third "Non-Contiguous Fill Area" held a variety of municipal and industrial wastes, including deteriorating drums and a variety of hazardous materials.



Muskego Sanitary Landfill Site Timeline



Old Landfills Contaminate Air, Soil, and Ground Water

At the state's request, WMWI conducted a ground water study in 1981, sampling residential and site monitoring wells. Because volatile organic compounds (VOCs) and heavy metals had migrated off site, WMWI purchased four homes south of the Old Fill Area in 1984. Then in 1985, WMWI paid for the extension of municipal water from the City of Muskego to affected homes in the immediate area.

Superfund Cleanup Begins

Following Congressional legislation authorizing the Superfund program, WDNR asked for assistance at the site. In 1985, EPA placed the Muskego Sanitary Landfill on the National Priorities List of sites requiring comprehensive cleanup. In 1987, after four months of negotiations, Waste Management, Inc. agreed to conduct extensive field investigations.

Shortly thereafter, WMWI discovered a trench that contained leaking 55-gallon drums of paint waste and industrial cleaning solvents. Under a unilateral order in 1991, WMWI removed 1,000 drums and 5,000 tons of contaminated soil and backfilled the trench.

First Remedy Selected

Later that year, EPA and WDNR used public comments to select a remedy to permanently close the landfills that included a multi-layer protective cap, leachate and methane control systems, soil treatment, and ground water monitoring.

Waste Management, Inc. agreed to undertake the remedy and prepared engineering designs over the next 18 months. Construction began in the summer of 1993 under EPA supervision and was completed in the fall of 1994.

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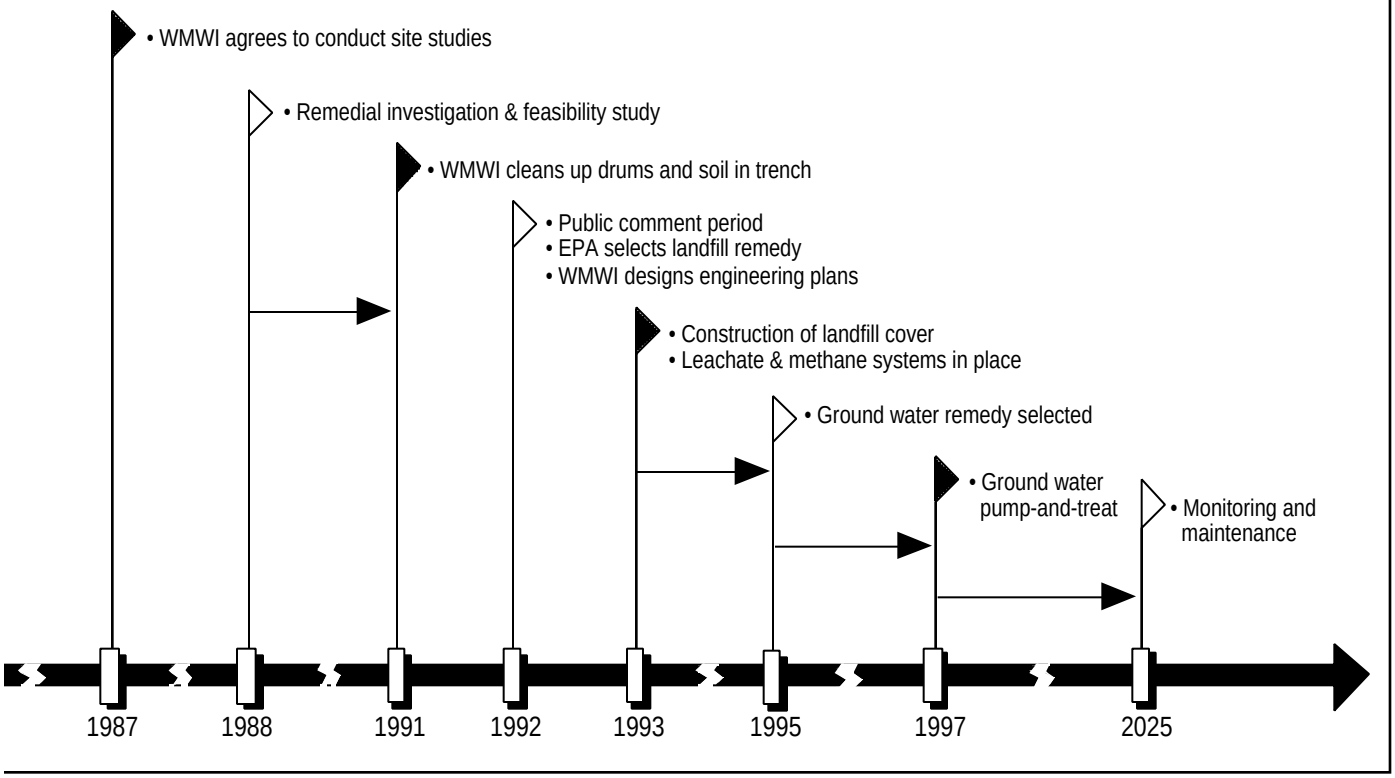

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How Does the Remedy Work?

The multi-layer protective cap seals off the wastes and prevents rain and snow from percolating into the ground water; grasses and ground covers grow on the surface.

A leachate collection system includes deep wells to pump toxins to the surface for treatment and discharge in a sanitary sewer. An underground piping network captures methane, a by-product of decomposing garbage that is highly explosive. A blower draws the gas into a carbon filter to remove VOCs and the remaining methane is flared. Internal pressure caused by gas formation in the landfill is relieved, reducing cracks in the protective cap.

A soil vapor extraction system is currently treating contaminated soil in the Non-Contiguous Fill Area. Soil vapor extraction works like a giant vacuum cleaner, drawing VOCs to the surface for destruction by a catalytic oxidizer.

In 1995, EPA selected a final ground water remedy aimed at arresting the migration of pollutants into ground water and nearby wetlands. Extraction wells near the Non-Contiguous Fill Area draw ground water for on-site treatment and discharge to the Milwaukee Metropolitan Sewage district through the Muskego public sewer system. This portion of the remedy should take two years to complete.

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Success at Muskego Sanitary Landfill

Old landfills are a problem throughout the U.S. because mixtures of wastes in unknown quantities lay buried like hidden time bombs. Cooperative efforts among federal, state, and a private operator resulted in an expeditious resolution to permanently close the landfill. Early removal actions helped to slow the migration of pollutants into ground water; a protective cover sealed off tons of industrial and municipal wastes.

Ground water contamination will require extraction and treatment through the year 1997 with monitoring and maintenance continuing until 2025.

EPA

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